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A
SCHEME
For a COURSE of
CHYMISTRY,
To be PERFORMED at
GRESHAM-COLLEGE,

By *HENRY PEMBERTON*, M.D.
And Fellow of the ROYAL SOCIETY.

THIS COURSE is to begin on *Monday* Jan. 18. 173$\frac{0}{1}$. at 4 o'Clock in the afternoon; and to be continued every *Monday*, *Wedneſday*, and *Friday*, till it is finiſhed.

The Terms to the Subſcribers are *Four Guineas*, to be paid on the day the Courſe begins; and thoſe who attend this Courſe, are free to be preſent at any other *gratis*.

THE deſign of this courſe is in the firſt place to perform the ſeveral operations of chymiſtry; both in the preparing of all the chymical medicines now in uſe; and alſo in the ſmelting, refining, and ſuch like proceſſes on metals.

It is propoſed in the ſecond place, to deſcribe, in the plaineſt and fulleſt manner, the method of proceeding in each operation, and to deliver all the cautions neceſſary to be obſerved in them.

In the laſt place, it is intended to have a particular regard to the uſe of chymiſtry in natural philoſophy. The proceſſes are diſpoſed in ſuch an order, as may be moſt conducive towards ſhewing the reaſon and true effects of each operation; and all the diſcoveries which have hitherto been made in nature by chymiſtry, will be particularly explained.

The proceſſes follow:

The nature and deſign of chymiſtry; its riſe and progreſs; together with the nature of heat, the principal inſtrument, by which chymical operations are performed.

Of chymical veſſels and lutes; the various kinds of furnaces, and different degrees of fire.

The principles deſcribed, into which bodies are reſolvible by a chymical analyſis, *viz.* Phlegm or water, ſpirits, oils, ſalts, earth, beſides an aërial vapour.

Animal ſubſtances analyzed.

The parts of animals diſtilled, whence a volatile ſpirit, volatile ſalt, fœtid oil, and caput mortuum, which by calcination is reſolved into pure earth.

The ſpirit and ſalt rectified per ſe, and with earth or chalk; the oil alſo rectified.

Urine diſtilled, to ſhew that the ſame ſubſtances come from that, as alſo the phoſphorus.

Milk examined.

Animal ſubſtances boiled, and the vapour collected, to ſhew that nothing of the animal ſubſtance riſes with it.

Vegetables analyzed.

The decoction of vegetables and the vapour collected; whence the ſimple diſtilled water, and eſſential oil. To obſerve what plants impregnate the watry vapour with any of their virtues, and what do not.

The plant diſtilled in a retort, and the different ſubſtances, which ariſe from acid and alkaline plants to be noted.

The reſidue, which comes out of the retort, calcined, and the fixt ſalt extracted from ſuch plants, whence it is to be obtained. Here to ſhew that fixed ſalt after every purification depoſites freſh earth.

The oils analyzed, gums and natural reſines diſtilled. Here alſo the diſtillation of honey and ſugar.

The eſſential ſalts of vegetables.

An account of fermentation.

Tartar boiled in water, or cremor tartari prepared.

Tartar diſtilled and calcined.

Wine and its lees diſtilled for its vinous ſpirit, and other parts.

Rectification of the vinous ſpirit per ſe.
Vinegar and its diſtillation.
Soot diſtilled.
Vegetables putrefied.

Compoſitions.

Fixt ſalt run by the air, or ol. tartari per deliquium.

The fermentation of fixed ſalt with vegetable acids: whence tartarus regeneratus, and tartarus tartarizatus.

Fixt ſalt united with oil into Soap. Here to be noted, that fixt ſalts by diſſolving the unctuous parts of vegetables make decoctions ſtronger. Here ſapo tartareus.

Fixt ſalt fluxt with vegetable or animal earths.

Volatile ſalt of urine made by the help of fixt ſalt.

Spirit of wine diſſolves oils, and being diſtilled from them brings over with it their flavour.

Strong diſtilled waters.

Spirit of wine rectified by fixt ſalt.

Tinctura ſalis tartari cum alcohole.

Tinctures with wine, Tinctur. Croc. Hier. &c.

————with ſpirit of wine, Tinct. Croc. Hier. Elix. Propriet. dulce, Sp. Vin. Camphor. &c. In general to ſhew that ſpirit of wine diſſolves reſins, and extracts that part out of plants. Here the preparation of Reſin of Jalap. To obſerve that the yolk of eggs alſo diſſolves theſe ſubſtances.

Tinctures by the help of ſalt of Tartar. Tinctur. ſerpentar. virgin. Myrrh. Elix. Propriet. Tartariz. Here to explain the uſe of this in diſſolving thoſe reſins, which yield with more than uſual difficulty.

Tinctures with vinegar. Magiſt. Corall. Acet. Scillit. &c. alſo oxymel.

The union of volatile ſpirit with alcohol or Offa Helmontii.

Salts analyzed.

Production, purification, cryſtallization, and decrepitation of common ſalt.

Spirit of ſalt with earth.

Production, purification, and cryſtallization of nitre.

Spirit of nitre diſtilled with earth.

Calcination of nitre with live coals and with tartar.

Borax examined.

Production, purification, and cryſtallization of alum.

Its calcination.

Alum diſtilled.

Production, purification, and cryſtallization of vitriol.

Calcination of vitriol, ſal vitrioli, and diſtillation of vitriol.

Compoſitions.

Fixt ſalt fermenting with theſe mineral acids. Whence

Regeneration of common ſalt with ſpirit of ſalt and fixt ſalt.

Regeneration of nitre in like manner.

Spirit of alum poured on fixt ſalt.

Tartarus vitriolatus.

Sal ammoniac, and its extemporaneous production with ſpirit of ſalt and ſpirit of urine.

Sublimation of ſal ammoniac.

Spirit of ſal ammoniac with fixt ſalt; and the reſidue, or the regeneration of common ſalt; alſo the

the rectification of animal volatile ſalts by ſpirit of ſea ſalt and fixt ſalt.

Sal volatile oleoſum.

Elixir Proprietatis Helmontii.

Sp. ſalis dulcis.

Spiritus nitri dulcis.

Oleum vitrioli dulce, and its rectification.

The effects of the three ſpirits of ſalt, of nitre, and of vitriol upon oil, and alſo upon camphire.

Spiritus ſalis Glawberi.

Spiritus nitri Glawberi, and its inflaming with animal, or ponderous vegetable oils.

The ſalts ariſing from the reſidue of theſe two foregoing proceſſes.

Aq. fort. ſimplex & duplex.

Aq. regia. Here ſhewn, that when Aq. regia is made by putting common ſalt into Aq. fortis, and the Aq. regia is drawn off, a kind of nitre is left behind.

The Phoſphorus with alum and vegetable or animal ſubſtances, or the phoſphorus of Homberg.

The Pruſſian blue and other pigments made by the help of alum.

Analyſis of ſulphurs and compoſitions.

Sublimation of ſulphur.

Spiritus ſulphuris per campanam, and gas ſulphuris.

Sulphur diſſolved with a fixt alkali, or hepar ſulphuris, and thence lac ſulphuris.

Sulphur diſſolved with alcohol or ſpirit of wine, or Tinctura ſulphuris Pharmac. Lond.

Sulphur diſſolved with oil. Whence Balſamum ſulphuris aniſatum and terebinthinatum.

Sulphur diſſolving reſins, whence ſcammonium ſulphuratum or diagrydium.

Lapis prunellæ or cryſtal mineral, ſal polycreſtus, and the calcination of nitre by ſulphur.

Gun-powder, and pulvis fulminans.

Diſtillation of Amber.

Stones, and imperfect metals.

Calcined ſtones and ſand melted with fixt ſalt into glaſs.

The phoſphorus with calcined chalk and ſpirit of nitre.

Lime, Aqua Calcis, Cauterium potentiale.

Spirit of urine with lime.

Spirit of ſal ammoniac with lime.

Lac ſulphuris with lime water.

Mr. Boyle's fuming liquor with ſulphur, lime, and ſal ammoniac.

Colcothar of vitriol, and Ens Veneris.

Biſmuth, its ſeparation from the ore, and the magiſterium Biſmuthi.

Zink or ſpelter.

Antimony.

Its Regulus with tartar and nitre.

The Regulus martialis, and oleum aureum.

Vitrum Antimonii.

Crocus metallorum, and vinum benedictum. To ſhew that the more nitre is uſed, the antimony becomes leſs emetic, ſo that with three times the quantity of nitre it loſes that property altogether, and becomes antimonium diaphoreticum.

Tartar emetic.

The ſublimation of antimony with ſal ammoniac, and antimonium reſuſcitatum.

Analyſis of metalline ores, and the refining of metals.

Flux powders.

Separation of Quickſilver from its ore.

Separation or ſmelting of Lead.

of Tin.

of Iron. Here to ſhew that all vegetable aſhes contain iron.

of Copper.

of Silver.

of Gold.

The great ductility to be obſerved of copper, ſilver, and eſpecially of gold.

Operations on metals, and compoſitions.

The method of making ſteel and braſs.

Mixing of metals, Bell metal, Bath metal, the metal of organ pipes, Pewter ſolder, *&c.*

Calcination of Quickſilver, or Mercurius præcipitatus per ſe.

Calcination of lead, or litharge and minium. To obſerve that litharge and minium diſſolve in oil; whence, emplaſtr. diachylon ſimplex, and emplaſtr. de minio.

Vitrum ſaturni.

Calcination of tin, or putty.

Calcination of iron, or crocus martis aſtringens.

Æthiops mineral, and cinnabar, by mixing quickſilver with ſulphur. Alſo the calcination of the other metals by ſulphur. Whence crocus martis aperiens.

The reſtitution of calcined metals.

The

The amalgamation of quickſilver with the other metals, except iron and copper.

To obſerve alſo that lead, when melted, diſſolves the other metals like a menſtruum.

Silver, copper, iron, lead, and quickſilver, diſſolved in aqua fort. and tin corroded by it.

The cryſtallization of the metals. Here Diana's tree.

The menſtruum evaporated: whence the lunar cauſtic, ☿ precipitatus ruber, & arcanum corallinum: with ſmall aq. fort. and lead a kind of ſaccharum ſaturni.

The precipitations of the metals. What metals precipitate others.

Precipitation of ſilver by mercury and ſpirit of ſalt; or by ſalt itſelf. Hence luna cornea and ☿ precipitatus albus.

The ſeparation of gold from ſilver by aq. fort.

The ſolution of gold and tin in aq. regia. Alſo of iron, copper, and lead by the ſame; as alſo by ſpirit of ſalt. Hence ſal chalyb. Batean.

Gold precipitated by ſal tartari makes aurum fulminans.

Sublimatus corroſivus, mercurius dulcis and calomel.

Butter and cinnabar of antimony. Ol. antimon. Mercurius vitæ. Bezoar mineral, and menſtruum peracutum of Mr. Boyle.

Gold diſſolved in the menſtruum peracutum of Mr. Boyle.

Tin ſublimed with ſublimate; whence Mr. Boyle's perpetually fuming liquor.

Iron and quickſilver diſſolved in oil of vitriol. Hence ſal martis with water or ſpirit of wine and oil of vitriol. Alſo crocus martis by igniting the ſal martis, and oleum martis per deliquium, by letting this crocus flow in the air. Tinctura aurea

Baſilii

Baſilii Valentini by digeſting this crocus with ſp. ſal. dulcis, or tinctura martis cum ſp. ſalis Pharm. Lond. Here alſo turbith mineral.

Copper, iron, and lead diſſolved in vinegar; alſo calcined tin. Ærugo æris, tinctura viridis, and unguentum Ægyptiacum; Limatur. chalyb. acet. ppt. ſacchar. ſaturni, and ſal jovis.

Solution of copper and iron by tartar. Hence chalybs tartarizatus.

Solution of copper by ſpirit of urine, and of iron by ſal tartari: hence aq. ſapphirrhina and chalybs ſine acido.

Sublimation of metals with ſal ammoniac; whence flores ſalis ammoniac. martiales; and tinctura martis Mynſichti. Aurum moſaicum.

Reflections upon the foregoing proceſſes and miſcellaneous experiments.